OIPE

#3

RAW SEQUENCE LISTING DATE: 12/06/2001 PATENT APPLICATION: US/09/847,539A TIME: 16:23:11

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Output Set: N:\CRF3\12062001\I847539A.raw

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3 <110> APPLICANT: Bjorck, Lars H
         Rassmussen, Magnus
 7 <120> TITLE OF INVENTION: STREPTOCOCCAL ALPHA ZM BINDING PROTEIN
 9 <130> FILE REFERENCE: 100084.415US / N.75312B
11 <140> CURRENT APPLICATION NUMBER: US 09/847,539A
12 <141> CURRENT FILING DATE: 2001-05-01
14 <160> NUMBER OF SEQ ID NOS: 30
16 <170> SOFTWARE: PatentIn Ver. 2.1
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21 <213> ORGANISM: Streptococcus pyogenes
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Input Set : A:\415us.app

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79 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
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82 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
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85 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
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88 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
91 Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
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                               120
94 Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
                           135
97 Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro Phe
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123 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
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126 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
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129 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
132 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
133
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Input Set : A:\415us.app

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155	Glu	Glu	-	Ala	Ile	Asp	Glu		Lys	Lys	Gln	Ala		Glu	Asp	Lys
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164	Lys	Ala	Asp	Asn	Ala	Ala	Ser	Asp	Ala		Glu	Ala	Leu	Ala		Gln
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167	Thr	Asp	Ala	Leu	Gln	Ser	Glu	Glu		Glu	Val	Val	Gln	Ser	Asp	Asn
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171			115					120					125			
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174		130					135					140				
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186 187	Met 1	_	Lys	Glu	Ile 5		Val Ala			10					15	
186 187	Met 1	_	Lys	Glu	Ile 5					10					15	
186 187 189 190	Met 1 Gly	Leu	Lys Val	Glu Ala 20	Ile 5 Val	Ser	Ala	Ser	Va1 25	10 Leu	Val	Gly	Ser	Thr	15 Val	Ser
186 187 189 190	Met 1 Gly	Leu	Lys Val	Glu Ala 20	Ile 5 Val	Ser		Ser	Va1 25	10 Leu	Val	Gly	Ser	Thr	15 Val	Ser
186 187 189 190 192 193	Met 1 Gly Ala	Leu Val	Lys Val Asp 35	Glu Ala 20 Ser	Ile 5 Val Pro	Ser Ile	Ala	Ser Gln 40	Val 25 Pro	10 Leu Arg	Val Ile	Gly Ile	Ser Pro 45	Thr 30 Asn	15 Val Gly	Ser Gly
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186 187 189 190 192 193 195 196	Met 1 Gly Ala Thr	Leu Val Leu 50	Lys Val Asp 35 Thr	Glu Ala 20 Ser Asn	Ile 5 Val Pro Leu	Ser Ile Leu	Ala Glu Gly	Ser Gln 40 Asn	Val 25 Pro Ala	10 Leu Arg Pro	Val Ile Glu	Gly Ile Lys 60	Ser Pro 45 Leu	Thr 30 Asn Ala	15 Val Gly Leu	Ser Gly Arg
186 187 189 190 192 193 195 196	Met 1 Gly Ala Thr	Leu Val Leu 50	Lys Val Asp 35 Thr	Glu Ala 20 Ser Asn	Ile 5 Val Pro Leu	Ser Ile Leu	Ala Glu Gly 55	Ser Gln 40 Asn	Val 25 Pro Ala	10 Leu Arg Pro	Val Ile Glu	Gly Ile Lys 60	Ser Pro 45 Leu	Thr 30 Asn Ala	15 Val Gly Leu	Ser Gly Arg
186 187 189 190 192 193 195 196 198	Met 1 Gly Ala Thr Asn 65	Leu Val Leu 50 Glu	Lys Val Asp 35 Thr	Glu Ala 20 Ser Asn Arg	Ile 5 Val Pro Leu Ala	Ser Ile Leu Ile 70	Ala Glu Gly 55	Ser Gln 40 Asn Glu	Val 25 Pro Ala Leu	10 Leu Arg Pro Lys	Val Ile Glu Lys 75	Gly Ile Lys 60 Gln	Ser Pro 45 Leu Ala	Thr 30 Asn Ala Ile	15 Val Gly Leu Glu	Ser Gly Arg Asp 80
186 187 189 190 192 193 195 196 198	Met 1 Gly Ala Thr Asn 65	Leu Val Leu 50 Glu	Lys Val Asp 35 Thr	Glu Ala 20 Ser Asn Arg	Ile 5 Val Pro Leu Ala	Ser Ile Leu Ile 70	Ala Glu Gly 55 Asp	Ser Gln 40 Asn Glu	Val 25 Pro Ala Leu	10 Leu Arg Pro Lys	Val Ile Glu Lys 75	Gly Ile Lys 60 Gln	Ser Pro 45 Leu Ala	Thr 30 Asn Ala Ile	15 Val Gly Leu Glu	Ser Gly Arg Asp 80
186 187 189 190 192 193 195 196 198 199 201 202	Met 1 Gly Ala Thr Asn 65 Lys	Leu Val Leu 50 Glu	Lys Val Asp 35 Thr Glu Ala	Glu Ala 20 Ser Asn Arg Thr	Ile 5 Val Pro Leu Ala Thr 85	Ser Ile Leu Ile 70 Ala	Ala Glu Gly 55 Asp	Ser Gln 40 Asn Glu Glu	Val 25 Pro Ala Leu Ala	10 Leu Arg Pro Lys Ala 90	Val Ile Glu Lys 75 Ser	Gly Ile Lys 60 Gln Ser	Ser Pro 45 Leu Ala Asp	Thr 30 Asn Ala Ile Ala	15 Val Gly Leu Glu Leu 95	Ser Gly Arg Asp 80 Glu
186 187 189 190 192 193 195 196 198 199 201 202	Met 1 Gly Ala Thr Asn 65 Lys	Leu Val Leu 50 Glu	Lys Val Asp 35 Thr Glu Ala	Glu Ala 20 Ser Asn Arg Thr	Ile 5 Val Pro Leu Ala Thr 85	Ser Ile Leu Ile 70 Ala	Ala Glu Gly 55 Asp	Ser Gln 40 Asn Glu Glu	Val 25 Pro Ala Leu Ala	10 Leu Arg Pro Lys Ala 90	Val Ile Glu Lys 75 Ser	Gly Ile Lys 60 Gln Ser	Ser Pro 45 Leu Ala Asp	Thr 30 Asn Ala Ile Ala	15 Val Gly Leu Glu Leu 95	Ser Gly Arg Asp 80 Glu
186 187 189 190 192 193 195 196 198 199 201 202 204 205	Met 1 Gly Ala Thr Asn 65 Lys	Leu Val Leu 50 Glu Glu Leu	Lys Val Asp 35 Thr Glu Ala Ala	Ala 20 Ser Asn Arg Thr	Ile 5 Val Pro Leu Ala Thr 85 Gln	Ser Ile Leu Ile 70 Ala	Ala Glu Gly 55 Asp Ile Asp	Ser Gln 40 Asn Glu Glu Ala	Val 25 Pro Ala Leu Ala Leu 105	10 Leu Arg Pro Lys Ala 90 Gln	Val Ile Glu Lys 75 Ser Ser	Gly Ile Lys 60 Gln Ser Glu	Ser Pro 45 Leu Ala Asp Glu	Thr 30 Asn Ala Ile Ala Ala 110	15 Val Gly Leu Glu Leu 95 Ala	Ser Gly Arg Asp 80 Glu Val
186 187 189 190 192 193 195 196 198 199 201 202 204 205	Met 1 Gly Ala Thr Asn 65 Lys	Leu Val Leu 50 Glu Glu Leu	Lys Val Asp 35 Thr Glu Ala Ala	Ala 20 Ser Asn Arg Thr	Ile 5 Val Pro Leu Ala Thr 85 Gln	Ser Ile Leu Ile 70 Ala	Ala Glu Gly 55 Asp	Ser Gln 40 Asn Glu Glu Ala	Val 25 Pro Ala Leu Ala Leu 105	10 Leu Arg Pro Lys Ala 90 Gln	Val Ile Glu Lys 75 Ser Ser	Gly Ile Lys 60 Gln Ser Glu	Ser Pro 45 Leu Ala Asp Glu	Thr 30 Asn Ala Ile Ala Ala 110	15 Val Gly Leu Glu Leu 95 Ala	Ser Gly Arg Asp 80 Glu Val
186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208	Met 1 Gly Ala Thr Asn 65 Lys Ala Val	Leu Val Leu 50 Glu Glu Leu Lys	Lys Val Asp 35 Thr Glu Ala Ala Ala 115	Ala 20 Ser Asn Arg Thr Asp 100 Asp	Ile 5 Val Pro Leu Ala Thr 85 Gln Asn	Ser Ile Leu Ile 70 Ala Thr	Ala Glu Gly 55 Asp Ile Asp	Ser Gln 40 Asn Glu Glu Ala Ser 120	Val 25 Pro Ala Leu Ala Leu 105 Asp	10 Leu Arg Pro Lys Ala 90 Gln	Val Ile Glu Lys 75 Ser Ser	Gly Ile Lys 60 Gln Ser Glu Glu	Ser Pro 45 Leu Ala Asp Glu Ala 125	Thr 30 Asn Ala Ile Ala Ala 110 Leu	15 Val Gly Leu Glu Leu 95 Ala	Ser Gly Arg Asp 80 Glu Val Asp
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186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208 210 211 213	Met 1 Gly Ala Thr Asn 65 Lys Ala Val Gln Asn	Leu Val Leu 50 Glu Glu Leu Lys Thr	Lys Val Asp 35 Thr Glu Ala Ala Ala Alsp	Ala 20 Ser Asn Arg Thr Asp 100 Asp	Ile 5 Val Pro Leu Ala Thr 85 Gln Asn Leu	Ser Ile Leu Ile 70 Ala Thr Ala Gln	Ala Glu Gly 55 Asp Ile Asp Ala Ser	Ser Gln 40 Asn Glu Glu Ala Ser 120 Glu	Val 25 Pro Ala Leu Ala Leu 105 Asp	10 Leu Arg Pro Lys Ala 90 Gln Ala	Val Ile Glu Lys 75 Ser Ser Leu Glu	Gly Ile Lys 60 Gln Ser Glu Glu Val 140	Pro 45 Leu Ala Asp Glu Ala 125 Val	Thr 30 Asn Ala Ile Ala Ala 110 Leu Gln	15 Val Gly Leu Glu Leu 95 Ala Ala Ser	Ser Gly Arg Asp 80 Glu Val Asp Asp
186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208 210 211 213 214	Met 1 Gly Ala Thr Asn 65 Lys Ala Val Gln Asn 145	Leu Val Leu 50 Glu Glu Leu Lys Thr 130 Ala	Lys Val Asp 35 Thr Glu Ala Ala Ala Ala Ala Ala	Ala 20 Ser Asn Arg Thr Asp 100 Asp Ala Ser	Ile 5 Val Pro Leu Ala Thr 85 Gln Asn Leu Asp	Ser Ile Leu Ile 70 Ala Thr Ala Gln Ala 150	Ala Glu Gly 55 Asp Ile Asp Ala Ser 135 Trp	Ser Gln 40 Asn Glu Glu Ala Ser 120 Glu Glu	Val 25 Pro Ala Leu Ala Leu 105 Asp Glu Lys	10 Leu Arg Pro Lys Ala 90 Gln Ala Ala	Val Ile Glu Lys 75 Ser Ser Leu Glu Ala 155	Gly Ile Lys 60 Gln Ser Glu Glu Val 140 Thr	Ser Pro 45 Leu Ala Asp Glu Ala 125 Val Pro	Thr 30 Asn Ala Ile Ala Ala 110 Leu Gln	15 Val Gly Leu Glu Leu 95 Ala Ala Ser	Ser Gly Arg Asp 80 Glu Val Asp Asp Leu 160
186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208 210 211 213 214 216	Met 1 Gly Ala Thr Asn 65 Lys Ala Val Gln Asn 145	Leu Val Leu 50 Glu Glu Leu Lys Thr 130 Ala	Lys Val Asp 35 Thr Glu Ala Ala Ala Ala Ala Ala	Ala 20 Ser Asn Arg Thr Asp 100 Asp Ala Ser	Ile 5 Val Pro Leu Ala Thr 85 Gln Asn Leu Asp	Ser Ile Leu Ile 70 Ala Thr Ala Gln Ala 150	Ala Glu Gly 55 Asp Ile Asp Ala Ser 135	Ser Gln 40 Asn Glu Glu Ala Ser 120 Glu Glu	Val 25 Pro Ala Leu Ala Leu 105 Asp Glu Lys	10 Leu Arg Pro Lys Ala 90 Gln Ala Ala	Val Ile Glu Lys 75 Ser Ser Leu Glu Ala 155	Gly Ile Lys 60 Gln Ser Glu Glu Val 140 Thr	Ser Pro 45 Leu Ala Asp Glu Ala 125 Val Pro	Thr 30 Asn Ala Ile Ala Ala 110 Leu Gln	15 Val Gly Leu Glu Leu 95 Ala Ala Ser	Ser Gly Arg Asp 80 Glu Val Asp Asp Leu 160
186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208 210 211 213 214 216 217	Met 1 Gly Ala Thr Asn 65 Lys Ala Val Gln Asn 145 Asp	Leu Val Leu 50 Glu Glu Leu Lys Thr 130 Ala Val	Lys Val Asp 35 Thr Glu Ala Ala Ala Lys	Glu Ala 20 Ser Asn Arg Thr Asp 100 Asp Ala Ser Lys	Pro Leu Ala Thr 85 Gln Asn Leu Asp Thr 165	Ser Ile Leu Ile 70 Ala Thr Ala Gln Ala 150 Lys	Ala Glu Gly 55 Asp Ile Asp Ala Ser 135 Trp Asp	Ser Gln 40 Asn Glu Glu Ala Ser 120 Glu Glu Glu	Val 25 Pro Ala Leu 105 Asp Glu Lys	10 Leu Arg Pro Lys Ala 90 Gln Ala Ala Pro 170	Val Ile Glu Lys 75 Ser Ser Leu Glu Ala 155 Val	Gly Ile Lys 60 Gln Ser Glu Glu Val 140 Thr	Ser Pro 45 Leu Ala Asp Glu Ala 125 Val Pro Lys	Thr 30 Asn Ala Ile Ala 110 Leu Gln Ile	15 Val Gly Leu 95 Ala Ala Ser Ala Glu 175	Ser Gly Arg Asp 80 Glu Val Asp Asp Leu 160 Glu
186 187 189 190 192 193 195 196 198 199 201 202 204 205 207 208 210 211 213 214 216 217	Met 1 Gly Ala Thr Asn 65 Lys Ala Val Gln Asn 145 Asp	Leu Val Leu 50 Glu Glu Leu Lys Thr 130 Ala Val	Lys Val Asp 35 Thr Glu Ala Ala Ala Lys	Glu Ala 20 Ser Asn Arg Thr Asp 100 Asp Ala Ser Lys	Pro Leu Ala Thr 85 Gln Asn Leu Asp Thr 165	Ser Ile Leu Ile 70 Ala Thr Ala Gln Ala 150 Lys	Ala Glu Gly 55 Asp Ile Asp Ala Ser 135 Trp	Ser Gln 40 Asn Glu Glu Ala Ser 120 Glu Glu Glu	Val 25 Pro Ala Leu 105 Asp Glu Lys	10 Leu Arg Pro Lys Ala 90 Gln Ala Ala Pro 170	Val Ile Glu Lys 75 Ser Ser Leu Glu Ala 155 Val	Gly Ile Lys 60 Gln Ser Glu Glu Val 140 Thr	Ser Pro 45 Leu Ala Asp Glu Ala 125 Val Pro Lys	Thr 30 Asn Ala Ile Ala 110 Leu Gln Ile	15 Val Gly Leu 95 Ala Ala Ser Ala Glu 175	Ser Gly Arg Asp 80 Glu Val Asp Asp Leu 160 Glu

Input Set : A:\415us.app

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Input Set : A:\415us.app

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355		_	115					120					125			
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362	145					150		Leu			155					160
365					165			Lys		170					175	
368				180				Thr	185					190		
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VERIFICATION SUMMARY

PATENT APPLICATION: US/09/847,539A

DATE: 12/06/2001 TIME: 16:23:12

Input Set : A:\415us.app